Silicone Sealants for Airfield Restoration

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Silicone Pavement Joint Sealants

- Properties
- Sealant selection
- Airfield applications
- Installation
- Maintenance
- Specifications

Silicone Pavement Joint Sealants

Properties:

- Fluid resistance
- Weatherability
- Movement capability

Silicone Pavement Joint Sealants
Fluid Resistance

- Wide pH range: between 2 and 12
- Proven Jet Fuel Resistance (JFR)
  - ASTM D3569 – Hot Pours

Silicone Pavement Joint Sealants

Weatherability

- Unaffected by the elements
- 5,000 hours QUV
  - Compared to 500 - 2500 hours
- Wide temperature range
  - -45 to 149 C°
    (-50 to 300 F°)

Silicone Pavement Joint Sealants
Movement Capability

- ASTM C 719: +100/-50%


USAF

Silicone Pavement Joint Sealants

Sealant Selection:

- Non-sag
- Self-leveling
- Rapid cure

Silicone Pavement Joint Sealants

Non-Sag Sealant

- Horizontal and/or vertical applications
- Requires tooling
- Highly recommended for runways
- Low modulus
- Cures in days

Silicone Pavement Joint Sealants

Self-Leveling Sealants

- Horizontal and slopes to approximately 5% grade
- No tooling required
- Little to no waste
- Ultra-low modulus
- OK for taxiways and aprons
- Use caution on runways
- Cures in days to weeks

Silicone Pavement Joint Sealants

Rapid Cure

- 2-part formulation, one-part application
- Thermal & dynamic movements
- Uniform cure
- Full cure – 24 hours
- Not common in airfield applications

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Airfield Applications:

- Runways
- Taxiways
- Aprons

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Runways vs. Taxiways & Aprons

- Impact loads
- Dynamic loads
- Rubber removal
- Limited closure time

Installation

Silicone Pavement Joint Sealants

Ease of Installation

- Cold applied
- Formed in place
- Requires no special startup/shutdown procedures

Silicone Pavement Joint Sealants
Installation:

- Sealant selection
- Joint preparation
- Install backer material
- Install sealant
- Quality control

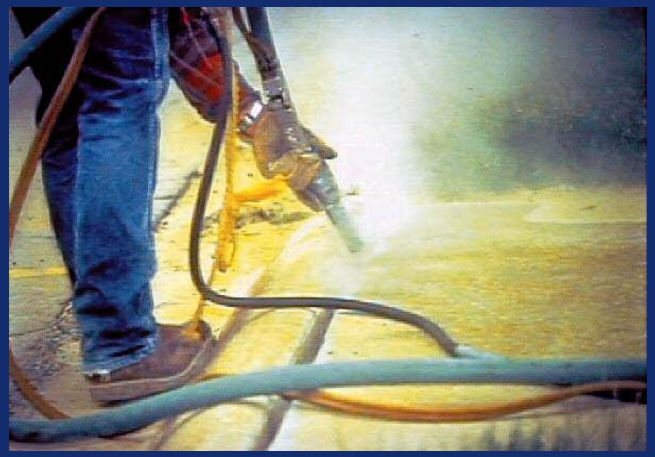
Silicone Pavement Joint Sealant

Joint Preparation

- Remove existing seal
  - Manually
  - Mechanically
- Sawing – proper size, sound substrate
  - Dry - allowed
  - Wet - recommended
    - Water-blast must follow wet sawing
    - Allow to dry (naturally)

Silicone Pavement Joint Sealant
Joint Preparation

- Sandblast
  - One side at a time
  - Hold nozzle close to surface to be blasted
- Air blow joint clean
  - One direction
  - Oil and water traps MUST be used



Silicone Pavement Joint Sealant

Joint Preparation

- Prime (if applicable)
  - Manufacturer specific
  - Follow application and dry time instructions
  - Do not over-prime
- Install backer material

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Install Backer Material

- Proper size
- Proper depth
- Compatible with sealant
- Inspect for gaps when using a self-leveling sealant

Silicone Pavement Sealants

Backer Rod

- ✓ Closed Cell – mandatory
- STOP Open Cell – not allowed
- ✓ SOF ® ROD – allowed

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Install Sealant

- Inspect prepared joint
- Clean, dry and frost-free
- Follow manufacturer's recommendations
  - Proper recess
  - Proper sealant thickness = 2:1 (width:depth)
    - Not less than ¼" or more than ½"
- Inspect as you go

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Joints Must Be:

- Dry
- Clean
- Frost-free

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Quality Control

- Inspect throughout the installation
- Check adhesion
- Check cross-section
- Check equipment
- Check material

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Adhesion Testing after Cure

- Verifies joint cleanliness
- Demonstrates bond capability
- Simple field adhesion test

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Maintenance:

- Easily repaired
- Bonds to itself
- Requires no special equipment

Silicone Pavement Joint Sealants
Specifications:

- Tight performance specs
- Living document – change as you learn
- Incorporate and dictate quality control measures

Silicone Pavement Joint Sealants

Specifications Should Address:

- Sealant properties
- Joint movement capability
- Sealant type
- Role of manufacturer
- Joint preparation
- Backer material selection
- Sealant installation
- Quality control

Silicone Pavement Sealants
Important Standards and Specs

- ASTM Standards/Specs
  - ASTM C719 - Cyclic Movement
  - ASTM D5893 – Formed-in-Place Silicone Sealant for Concrete Pavement
  - ASTM C793 - Weatherability
  - ASTM D3569 - Jet Fuel Resistance (hot applied)

Silicone Pavement Sealants
Important Standards and Specs

- NCEL CR 91.002 – Jet Blast/Jet Fuel Resistance
- UFGS-02762N (NAVFAC)
  - Old Navy Spec – NFGS-02522 – New Construction
- UFGS-02982N (NAVFAC)
  - Old Navy Spec NFGS-02562 – Renovation
- Air Force Spec
  - ETL 94-9 Silicone Joint Sealant for Pavements

Silicone Pavement Joint Sealants
What we covered!

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- Airfield applications
- Installation
- Maintenance
- Specifications

Questions?